

***Papatuka alamunyiga* Deans, a new genus and species of apterous ensign wasp (Hymenoptera: Evaniidae) from Kenya**

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Abstract

An apterous ensign wasp, *Papatuka alamunyiga* Deans **gen. nov.**, **sp. nov.**, from Kenya is described and illustrated. A diagnosis differentiating *P. alamunyiga* from other apterous ensign wasps is provided as well as a discussion of its potential relationship to other evaniid genera.

Key words: Evaniidae, ensign wasp, apterous, wingless, *Papatuka*, taxonomy, Africa

Introduction

The family Evaniidae (Hymenoptera) has long been neglected taxonomically and remains organized according to Kieffer's (1912) outdated and inadequate monograph (few illustrations and poorly constructed keys) and Hedicke's (1939) incomplete catalogue of species. Several fossil genera have been described recently (Basibuyuk et al. 2002; 2000a; 2000b), but no extant genera have been described since *Afrevania* Benoit (1953).

Papatuka alamunyiga Deans represents the first record of a wingless ensign wasp and is difficult to place among the current evaniid genera as defined by Kieffer (1912). The classification outlined in Kieffer (1912) is based entirely on wing venation, without consideration of other characters (e.g. surface sculpturing, tarsal claw, metasoma, leg, mouthpart, and ovipositor morphology). A comparison of *P. alamunyiga* with other evaniid genera justifies its description as a new genus.

Materials and methods

Morphological terminology used in the description follows Sharkey & Wharton (1997) with sculpture pattern concepts drawn from Harris (1979). Photographic images were cap-

tured digitally through a Leica MZ12 microscope using a JVC GC-QX5HD camera set for maximum definition. Pen and ink illustrations were made using a camera lucida attached to the aforementioned microscope.

The single specimen was borrowed from The Natural History Museum in London (U.K.) and compared with determined material from the following repositories: American Entomological Institute (U.S.A.), Australian Museum (Australia), The Natural History Museum London (U.K.), California Academy of Sciences (U.S.A.), Essig Museum of Entomology (U.S.A.), Florida State Collection of Arthropods (U.S.A.), Instituto Nacional de Biodiversidad (Costa Rica), Illinois Natural History Survey (U.S.A.), Museum of Comparative Zoology (U.S.A.), Muséum National d'Histoire Naturelle (France), Lund University Insect Collection (Sweden), Staatliches Museum für Naturkunde Stuttgart (Germany), Texas A & M University (U.S.A.), R. M. Bohart Museum of Entomology (U.S.A.), University of California Riverside Insect Collection (U.S.A.), University of Michigan Museum of Zoology (U.S.A.), and the National Museum of Natural History (U.S.A.).

***Papatuka* Deans, gen. nov.**

Type species.- *Papatuka alamunyiga* Deans, current designation.

Habitus (female): Apterous, antlike in appearance with relatively small eyes, long antennae, and long legs.

Head: Position of the mandible and small eye give head a somewhat elongate appearance, sparsely setose with short fine hairs, nitid laterally, sparsely sculptured frontally. Head hemispherical in lateral view. Face with 2 lines leading ventrally from antenna sockets to clypeus. Clypeus flat, slightly protruding medially. Antenna long, setose with short fine hairs. Flagellomeres numbering 11 with placoid sensilla. Mandible with 4 teeth. Maxillary and labial palps extremely short, with 4 and 3 segments respectively, mostly obscured behind mandibles. Ocelli relatively reduced.

Mesosoma: Appearing strongly compacted dorsally and very sparsely sculptured. Mesoscutum protruding slightly over pronotum. Epicnemial carina present as strong ridge. Metapleural furculum present with short, broadly separated projections. Notauli present as linear impressions. Tegulae and wings completely absent. Legs elongate. Fore and mid coxae widely separated. Hind and mid coxae almost touching. Tarsomeres elongate, with some erect spines slightly longer than surrounding setae. Tarsal claw elongate and thin with basal tooth as wide as terminus but shorter.

Metasoma: Petiole (metasomal tergite 1) rugose laterally, rugulose and sparsely foveolate dorsally, relatively long. Gaster (metasomal tergites 2-8) relatively large, ovoid, with all segments present and roughly equal in size. Metasoma tergum 9 setose posteriorly. Hypopygium expanded posteriorly and dorsally. Ovipositor short, straight, partially hidden within metasoma, exerted portion as long as hind tarsomere 3. Ovipositor sheath setose at tip, slightly shorter than ovipositor.

Etymology: The genus name is a Swahili word (papatuka) meaning “to be clean” and refers to the general appearance of this wasp (wingless, very little sculpturing or setae) when compared with other ensign wasps. The gender is feminine.

***Papatuka alamunyiga* Deans, sp. nov.**

(Figs 1-3)

FEMALE – Diagnosis: Apterous, antlike in appearance (Fig. 1A), eyes relatively small (fig 2A), body reddish brown, mesosoma relatively compact (Fig. 1A, 2B), legs long (Fig. 1A), palps reduced and mostly obscured behind mandibles.

Head (Figs. 1A, 2A-B): Reddish brown, as wide as high in frontal view (mandible and small eye give head a somewhat elongate appearance), sparsely setose with short fine hairs, nitid laterally with finely punctate face and frons, hemispherical in lateral view. Density of fine punctures on face and frons increase towards midline of head (Fig. 2A). Slightly raised area surrounding antennal socket. Face with 2 depressed lines leading ventrally from antenna sockets to clypeus (Fig. 2A). Clypeus flat, slightly protruding medially. Gena 1.5 times longer than eye height, mostly nitid with scattered slight punctures. Postgenal area nitid with scattered short fine setae. Occipital carina present as fine ridge. Antenna reddish brown becoming orange apically, setose with short fine hairs, slightly longer than body (head to tip of metasoma). Scape as long as pedicel plus first 2 flagellomeres. Flagellomeres numbering 11 with placoid sensilla, middle flagellomeres not obviously swollen. Mandible orange with 4 reddish teeth, sparsely setose basally becoming denser near teeth. Maxillary and labial palps extremely short, with 4 and 3 segments respectively, mostly obscured behind mandibles. Eye small, 0.3 times head height, silvery grey. Ocelli small, translucent yellow. Median ocellus diameter 0.75 times lateral ocellus. Line between lateral ocelli 1.8 times line between lateral ocellus and median ocellus.

Mesosoma (Fig. 1A): Reddish brown, finely setose, appearing compact dorsally. Mesoscutum protruding slightly over pronotum. Pronotum dorsally punctate becoming rugulose posteriorly and scrobiculate ventrally. Propleuron punctate dorsally becoming rugulose ventrally. Mesopleuron sparsely foveolate ventrally with nitid medial area. Ventral half of posterior mesopleural border scrobiculate. Anterodorsal corner of mesopleuron with series of depressions forming short scrobiculate line. Epicnemial carina present as strong ridge ending above fore coxa in deep depression. Ventral mesopleuron and metapleuron rugose. Metapleural furculum present with short, broadly separated projections. Mesoscutum punctate, 1.7 times longer than wide. Notauli present as linear impressions. Scutellum 2 times wider than long, reddish anteriorly becoming brown posteriorly, protruding over metanotum. Metanotum thin, obscurely scrobiculate, except nitid medially. Metapleuron punctate-foveolate becoming rugulose posteriorly (under petiole) and

broadly scrobiculate dorsally (near insertion of petiole). Propodeum swollen, rugulose. Legs reddish orange except coxae orange. Hind leg more than 3 times longer than mesosoma height. Fore and mid coxae widely separated. Hind and mid coxae almost touching. Coxae, trochanters, trochantellae, femora punctate and setose with fine hairs. Tibiae obscurely and finely rugulose with no long erect spines. Tibial spurs orange, inner spur 1.2 times longer than outer spur. Tarsomeres elongate, with some erect spines slightly longer than surrounding setae. Tarsal claw (Fig. 1B) elongate and thin with basal tooth as wide as terminal tooth but shorter.

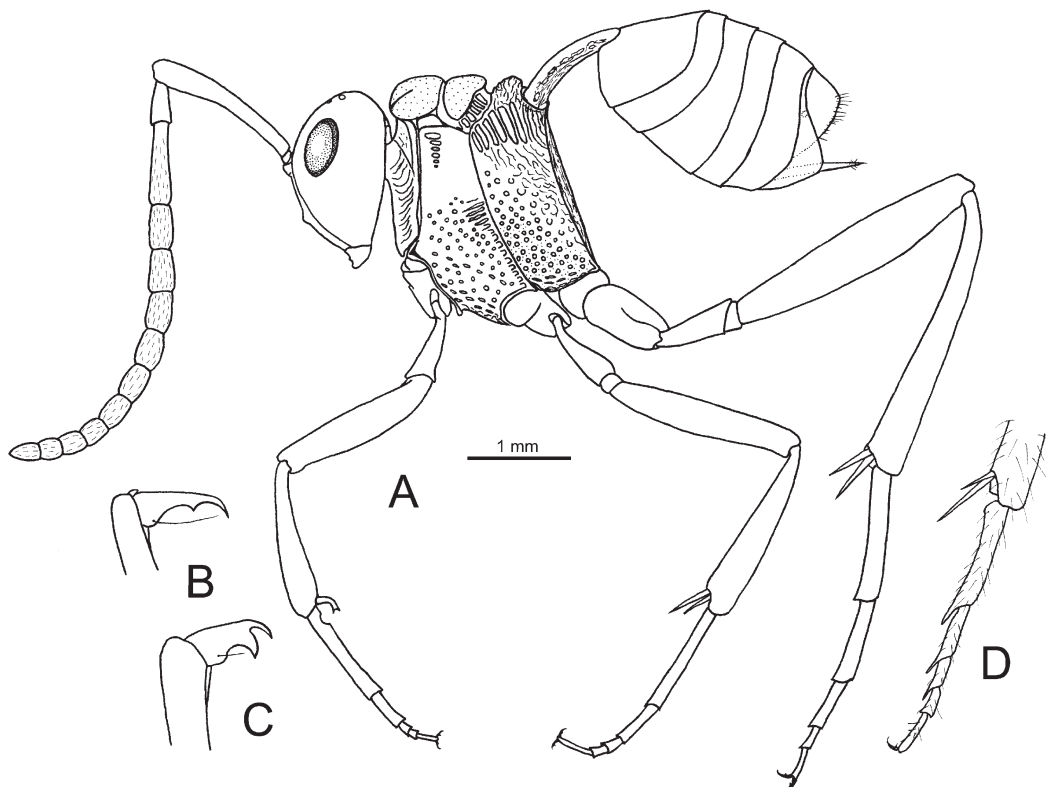


FIGURE 1. *Papatuka alamunyiga*, **gen. nov. & sp. nov.**, A, sinistral habitus, B, tarsal claw, not same scale as habitus, C, *Parevania afra* Kieffer tarsal claw for comparison, not same scale as habitus, D, “genus D” hind tarsomeres for comparison, not same scale as habitus. Proportions may vary slightly from description due to angular distortion during illustration.

Metasoma (Fig. 1A): Petiole rugose laterally, rugulose and sparsely foveolate dorsally, as long as hind tarsomere 2. Gaster (metasomal tergites 2-8) brown, relatively large, ovoid, with all segments present and roughly equal in size. Metasoma tergum 9 setose posteriorly. Hypopygium expanded posteriorly and dorsally. Ovipositor short, straight, partially hidden within metasoma, exerted portion as long as hind tarsomere 3. Ovipositor sheath yellow, setose at tip, slightly shorter than ovipositor.

Etymology.- The species epithet combines the Swahili words for “flag” or “ensign” (alamu) and “wasp” (nyiga).

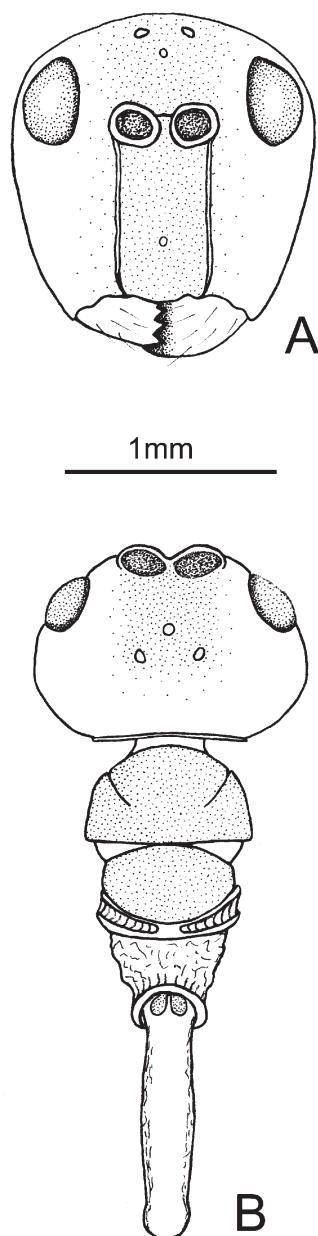


FIGURE 2. *Papatuka alamunyiga*, **gen. nov. & sp. nov.**, A, frontal view of head, B, dorsal habitus excluding metasomal terga posterior to the petiole. Proportions may vary slightly from description due to angular distortion during illustration.

Material examined.- HOLOTYPE: Body length (head to tip of mesosoma) = 5.0 mm., female. Data from three labels (embellishments in brackets): “van Someren Ngong [Kenya] 2 42 [II-1942]”, “V.G.L. van Someren Collection Brit. Mus. 1959-468”, “ex nest of ? *Dasyproctus westermanni*” (Fig. 3). Deposited in The Natural History Museum, London, U.K.

Comments.- One of the labels (Fig. 3) suggests a possible relationship with a nest of *Dasyproctus westermanni* (Dahlbom) (Hymenoptera: Sphecidae: Crabroninae). However, the collector qualifies this information with a question mark and provides no further details. It is unknown whether this questions the sphecid determination or the association of the ensign wasp with the sphecid nest. *Dasyproctus* spp. are common and diverse in central and eastern Africa; they construct nests in plant stems (usually woody shrubs or grasses), stocking them exclusively with adult flies (Bohart and Menke 1976).

P. alamunyiga represents the first described wingless evaniid species, but at least one other exists. An undescribed species belonging to “genus D” of Huben (1995) is currently being described by M. Huben (personal communication). This other species has been collected only in the mountainous areas of Ecuador (Andes) and differs from *P. alamunyiga* in the number of flagellomeres (“genus D” only has eight compared to eleven in *P. alamunyiga*) and hind leg morphology (tarsomeres each strongly prolonged posteriorly in “genus D” but not in *P. alamunyiga*; see Fig. 1D).

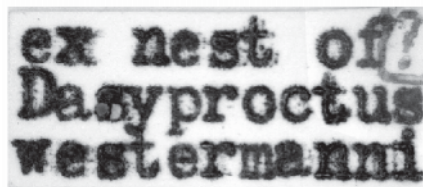


FIGURE 3. *Papatuka alamunyiga*, gen. nov. & sp. nov., third label from holotype with potential biological association information.

Discussion

The morphological characteristics of *Papatuka alamunyiga* (Figs. 1A-B, 2A-B) suggest a close relationship to *Parevania* Kieffer and possibly *Prosevania* Kieffer. The head sculpturing (nitid to punctate) and shape (hemispherical in lateral view), ovipositor size and shape (relatively short, straight, partially concealed by hypopygium), and metasoma configuration (ovoid with all segments present, roughly similar in size) place *Papatuka* close to *Parevania*. However, no species in *Parevania* have reduced eyes, reduced ocelli, or a highly compressed mesosoma. Species in *Parevania* also have compact tarsal claws, each

with an expanded basal tooth (Fig. 1C), rather than the elongate claws, each with reduced basal tooth, found in *Papatuka* (Fig. 1B). *Papatuka* has a flattened, smooth area on the mesopleuron similar to *Prosevania* but lacks the elongate furrow normally present below the wing insertion as well as the strigate genae usually present for species in this genus.

Although most apocritan families include at least one wingless species, none have been described in the Evanioidea (Evaniidae + Gasteruptiidae + Aulacidae). Expanded taxonomic and rearing efforts within this superfamily will undoubtedly yield more undescribed apterous evanioids and provide exciting (and hopefully verifiable) biological exceptions.

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References

- Basibuyuk, H.H., Rasnitsyn, A.R., Fitton, M.G., & Quicke, D.L.J. (2002) The limits of the family Evaniidae (Insecta: Hymenoptera) and a new genus from Lebanese amber. *Insect Systematics and Evolution*, 33, 23-34.
- Basibuyuk, H.H., Fitton, M.G., Rasnitsyn, A.R., & Quicke, D.L.J. (2000a) Two new genera of the Evaniidae (Insecta: Hymenoptera) from Late Cretaceous New Jersey amber. *In*: D. Grimaldi (Ed), *Studies on Fossils in Amber with Particular Reference to the Cretaceous of New Jersey*, Backhuys Publishers, The Netherlands, pp. 313-325.
- Basibuyuk, H.H., Rasnitsyn, A.R., Fitton, M.G., & Quicke, D.L.J. (2000b) An archaic new genus of Evaniidae (Insecta: Hymenoptera) and implications for the biology of ancestral evanioids. *Bulletin of the Natural History Museum of London (Geology)*, 56, 53-58.
- Benoit, P.L.G. (1953) Trois nouveaux Evaniidae du Congo belge (Hymen.) *Revue de Zoologie et de Botanique Africaines*, 48, 257-260.
- Bohart, R.M. & Menke, A.S. (1976) *Sphecid Wasps of the World*. University of California Press, Berkeley, CA, U.S.A., 695 pp.
- Harris, R. (1979) A glossary of surface sculpturing. *California Department of Food and Agriculture Occasional Papers – Entomology*, 28, 1-31.
- Hedicke, H. (1939) Evaniidae. *In*: H. Hedicke (Ed), *Hymenopterorum Catalogus* Pars 9, Dr. W. Junk, Gravenhage, 50 pp.
- Huben, M. (1995) Evaniidae. *In*: Hanson, P.E. & Gauld, I. D. (Ed), *The Hymenoptera of Costa Rica*, Oxford University Press, Oxford, U.K., pp. 195-199.
- Kieffer, J.J. (1912) Hymenoptera, Ichneumonoidea, Evaniidae. *Das Tierreich* 30, 1-431.

- Sharkey, M.J. & Wharton, R.A. (1997) Morphology and Terminology. *In*: Wharton, R. A., Marsh, P. M., & Sharkey, M. J. (Ed) *Manual of the New World Genera of the Family Braconidae (Hymenoptera)*, Special Publication of the International Society of Hymenopterists Number 1, Washington D. C., U.S.A., pp. 19-37.